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(72) Inventor: Jansen, Tom Cornelis
1511 AE Oostzaan (NL)

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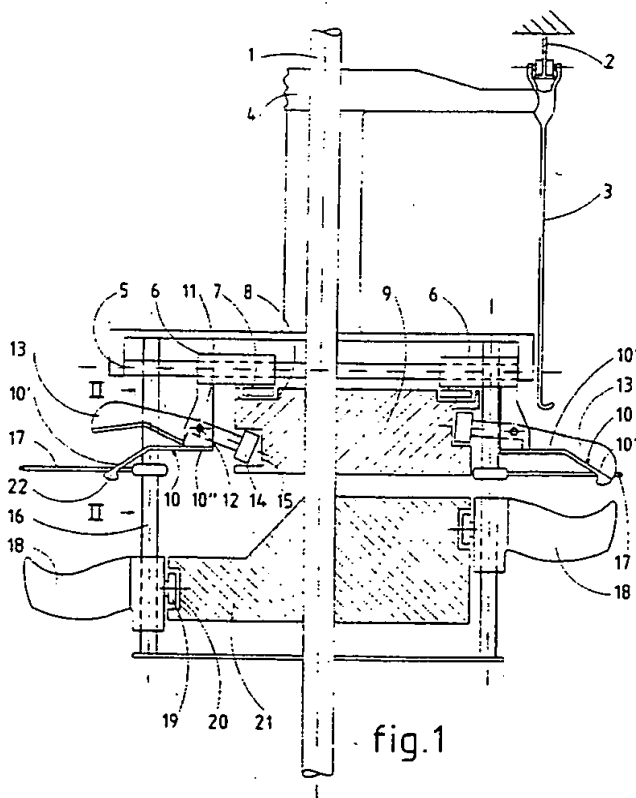
(74) Representative:
Voncken, Bartholomeus Maria Christiaan
Octrooibureau Los en Stigter B.V.
Weteringschans 96
1017 XS Amsterdam (NL)

(71) Applicant: MACHINEFABRIEK MEYN B.V.
NL-1511 AE Oostzaan (NL)

(54) Apparatus for opening the body cavity of a slaughtered bird

(57) The invention relates to an apparatus for opening the body cavity of a slaughtered bird starting from the cloaca. Through the cloaca a tensioning means (10) is applicable into the body cavity and towards the tip of the chest, which tensioning means tensions the skin of the bird. Next a cutting device (13) cooperating with said

tensioning means in a scissors-like manner cuts the skin. The tensioning means may comprise two plate sections positioned alongside each other. The apparatus may be part of a rotating processing apparatus at the circumference of which regularly spaced a number of such apparatus are provided.



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Description

The invention relates to an apparatus for opening the body cavity of a slaughtered bird starting from the cloaca.

Using a known apparatus of said type a two-piece sphere is pushed into the cloaca of the bird, whereafter one half of the sphere is inwardly moved towards the tip of the chest of the bird. At said side of the half sphere facing the skin of the bird a knife is provided which cuts through the skin during the motion of the half sphere.

This known apparatus suffers from several disadvantages. Firstly it cannot be prevented that in certain cases the knife also cuts through intestines, such as to expose its contents which contaminates the bird. Secondly the knife will become blunt rapidly, such that for a proper operation of the apparatus the knife should be replaced frequently. Thirdly said known apparatus cannot properly take into account birds having different dimensions. If a very small bird has to be opened it can happen that the knife cuts through the tip of the chest of the bird, which is undesirable. However, in case of a bird being larger than average, the cut is not made large enough such that the bird is not fully opened.

It is an object of the invention to provide an apparatus for opening the body cavity of a slaughtered bird starting from the cloaca, in which these disadvantages have been removed in a simple, but nevertheless effective way.

Thus the apparatus according to the invention is characterised by a tensioning means which is applicable into the body cavity through the cloaca and towards the tip of the chest for engaging the skin of the bird from the inside, and by a cutting device cooperating with said tensioning means in a scissors-like manner. The tensioning means is applied into the body cavity of the bird through the cloaca and towards the tip of the chest and like this tensions the skin between the cloaca and the tip of the chest. Next the cutting device is activated as a result of which the skin of the bird between the cloaca and the tip of the chest is cut open. By means of the tensioning means a reproducible positioning of the bird relative to the cutting device occurs, as a result of which the created opening extends always along the entire desired distance (from the cloaca until the tip of the chest). Moreover one can prevent that an undesired damaging of the intestines occurs because the tensioning means is pushed into the body cavity of the bird immediately below the skin, and thus between the intestines and the skin. The motion of the cutting device is determined by the location of the tensioning means, such that the cutting device too will not engage the intestines. Finally, due to the scissors-like operation a lower wear of the parts of the apparatus is obtained, especially of the cutting device, such that replacement thereof has to occur considerably less frequently compared to the knife of the known apparatus.

According to a preferred embodiment of the appa-

ratus according to the invention the tensioning means comprises two corresponding plate sections positioned alongside each other leaving free therebetween a slot for receiving the cutting device. Both plate sections tension the skin of the slaughtered bird between the cloaca and the tip of the chest from the inner side. While opening the body cavity the cutting device will move downward between both plate sections while both plate sections keep supporting the skin at both sides of the cutting device. Like this, cutting open of the body cavity can be carried out optimally without, for example, a shift of the skin occurring.

Constructively an embodiment of the apparatus is preferred in which the tensioning means is shaped as a rod with a first rearmost part which extends substantially in parallel with its direction of application and with a foremost part connecting thereto and enclosing therewith such an angle, that the convex side of the rod will engage the skin of the bird. By means of the foremost part which defines an angle the tensioning means is pushed into the cloaca of the bird to be processed. When next the tensioning means is moved towards the tip of the chest at the innerside of the skin the foremost part takes care of gradually tensioning the skin. In this aspect the convex shape of a rod is adapted to the anatomy of the bird.

In this aspect it further is preferred that the tip of the foremost part of the tensioning means is bluntly shaped. Such a blunt tip offers two advantages. At one hand it prevents that the tip of the tensioning means breaks through the intestines, whereas at the other hand damaging the tip of a chest, especially of small birds, is avoided. In case of a small bird the blunt tip will stretch the tip of the chest, such that on activation of the cutting device the tip of the chest will stay out of reach from it.

Further a special embodiment of the apparatus is mentioned, according to which the tensioning means and the cutting device are mounted onto the circumference of a rotating processing apparatus, wherein the tensioning means and the cutting device are radially movable relative to the processing apparatus, whereas further the cutting device is pivotable relative to the processing apparatus. Such a rotating processing apparatus is used on a large scale for processing slaughtered birds. Often such a processing apparatus cooperates with a suspension conveyor using which birds are conveyed suspended by their legs. Then the track of the suspension conveyor coincides with part of the circumference of the processing apparatus, such that at that position the processing apparatus can process passing birds. Generally such a processing apparatus carries a number of tensioning means and cutting devices cooperating therewith regularly spaced around its circumference.

If such a rotating processing apparatus is applied it may comprise cooperating follower rolls and curved tracks provided on the tensioning means and the cutting device as well as the processing apparatus, respective-

ly, for realising the radial motion and pivotment of the tensioning means and cutting device, respectively. Per se curved tracks and follower rolls cooperating therewith for realizing a wide range of movements are known.

Finally there is mentioned the possibility that positioning means are applied for positioning a bird to be processed relative to the tensioning means. As a result of said positioning means a bird has a stationary position relative to the tensioning means and to the cutting device while opening the body cavity. Particularly this is essential at the moment where the tensioning means is pushed into the cloaca, because at such a moment the cloaca should have an exactly defined position.

Hereinafter the invention is elucidated referring to the drawing in which an embodiment of the apparatus according to the invention is illustrated.

Fig. 1 shows schematically and in section part of an embodiment of the apparatus according to the invention, and

fig. 2 shows on a larger scale a section according to II-II in fig. 1.

Fig. 1 shows schematically part of a longitudinal section of an apparatus for opening the body cavity of a slaughtered bird. The illustrated apparatus defines a processing apparatus rotating around a central axis 1. In a way known per se said processing apparatus cooperates with a suspension conveyor 2 which is provided with suspension hooks 3 engaging the legs of a slaughtered bird. The motion of the suspension conveyor 2 and the rotation of the processing apparatus are synchronised through an uppermost section 4 of the processing apparatus. This belongs to the general knowledge of an expert in this field, such that a further explication is redundant. The processing apparatus comprises radially extending guides 5 regularly spaced around its circumference along which slides 6 are movable to and fro. Each slide 6 carries a follower roll 7 cooperating with a curved track 8 defined in a stationary core 9 of the processing apparatus.

The slide 6 carries a tensioning means 10 which, as appears from fig. 2, comprises two rods positioned alongside each other each having a foremost part 10' and a rearmost part 10". The rods 10 each are connected with the slide 6 by means of a connecting plate 11.

An embodiment comprising only one rod 10 is conceivable too.

By means of a hinge axis 12 a plate-like cutting device 13 is positioned between both connecting plates 11. Onto the rearward side of said cutting device 13 again a follower roll 14 is mounted cooperating with a curved track 15 at the stationary core 9.

The processing apparatus further comprises vertical guidings 16, a U-shaped brace 17 provided stationary thereto and known per se and a positioning plate 18 movable upward and downward along the guiding 16, which for its upward and downward motion is provided

with a follower roll 19 cooperating with a curved track shaped in a stationary core 21.

The apparatus operates as follows:

A slaughtered bird (not illustrated) which is supplied suspending with its legs from a suspension hook 3 of the suspension conveyor 2, is positioned with its legs at both sides of the U-shaped brace 17 while its back faces the central axis 1 of the apparatus. During the rotational motion of the apparatus the follower roll 19 of the positioning plate 18 follows the curved track 20, such that the plate 18 is moved upward and engages the lower side of the legs of the bird and as a result pushes the bird with its lower body firmly against the U-shaped brace 17. Like this an exactly defined position of the bird occurs.

Further, as a result of the rotation of the apparatus around the central axis 1 and through a cooperation between the follower roll 7 of the slide 6 and the curved track 8 defined in the stationary core 9, the slide 6 will move to the left (as seen in fig. 1) such that the rods 10 with their end (which is provided with a blunt tip 22) are pushed into the cloaca of the bird. Along the inclined foremost part 10' the skin of the bird is tensioned between the cloaca and the tip of the chest. The tensioned position of the skin is indicated schematically in fig. 2 by a dotted line 24. Generally the slide 6 will be displaced that far until it has been guaranteed that, irrespective the dimension of the bird to be processed, the blunt tips 22 of the rods 10 engage the tip of the chest of the bird.

Probably it is superfluous to mention that the radial change of position of the curved track 8 relative to the central axis 1 is always the same as the radial change of position of the curved track 15 which is followed by the follower roll 14 which takes care of a pivotment of the cutting device 13 around hinge axis 12.

When, in correspondence with the above, the rods 10 acting as tensioning means have tensioned the skin of the bird, the follower roll 14 reaches a rising section of the curved track 15 such as to pivot the cutting device 13 around hinge axis 12. As a result the cutting device 13 moves towards the slot 23 extending between both rods 10 (see fig. 2). Due to the cooperation between the cutting device 13 and both rods 10 the skin is cut open from the cloaca until the tip of the chest of the bird. The end position reached by the rods 10 and a cutting device 13 after cutting open the body cavity of the bird, is represented at the right in fig. 1. One can see that the radial position of the rods 10 and the cutting device 13 relative to the central axis 1 has been changed, such that these are further distanced from the axis. Moreover the cutting device 13 is pivoted downward between both rods 10. Further this side of fig. 1 shows that the positioning plate 18 is moved upward.

After the body cavity of the bird is cut open like this all parts move back towards their starting position, whereafter the corresponding suspension hook 3 leaves the section of its track corresponding with a section of the circumference of the processing apparatus and re-

moves the bird from the processing apparatus.

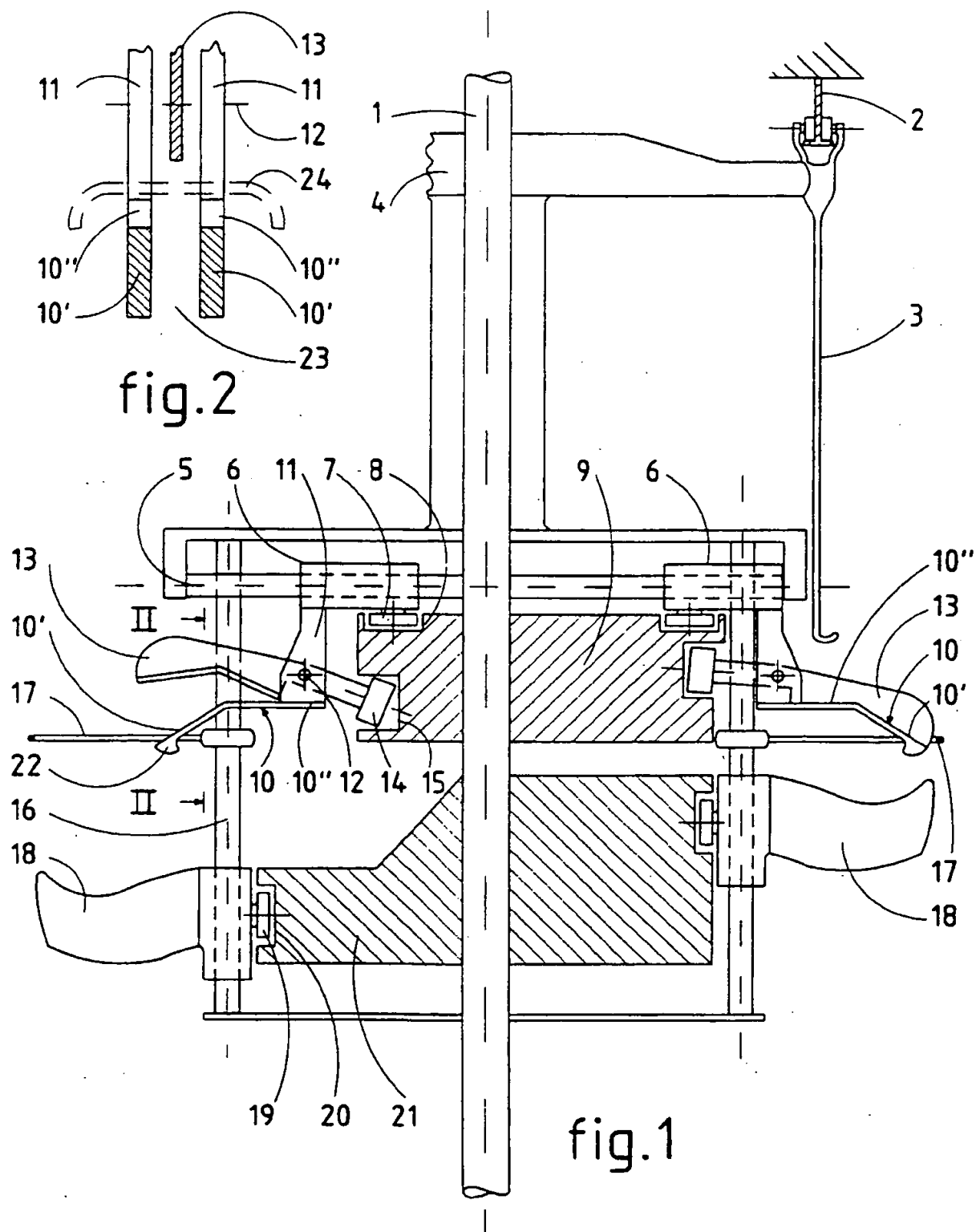
The invention is not limited to the embodiment described before which can be varied widely within the scope of the invention as defined by the claims.

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Claims

1. Apparatus for opening the body cavity of a slaughtered bird starting from the cloaca, **characterised** by a tensioning means which is applicable into the body cavity through the cloaca and towards the tip of the chest for engaging the skin of the bird from the inside, and by a cutting device cooperating with said tensioning means in a scissors-like manner.
2. Apparatus according to claim 1, **characterised** in that the tensioning means comprises two corresponding plate sections positioned alongside each other leaving free therebetween a slot for receiving the cutting device.
3. Apparatus according to claim 1 or 2, **characterised** in that the tensioning means is shaped as a rod with a first rearmost part which extends substantially in parallel with its direction of application and with a foremost part connecting thereto and enclosing therewith such an angle, that the convex side of the rod will engage the skin of the bird.
4. Apparatus according to claim 3, **characterised** in that the tip of the foremost part of the tensioning means is bluntly shaped.
5. Apparatus according to one of the previous claims, **characterised** in that the tensioning means and the cutting device are mounted onto the circumference of a rotating processing apparatus, wherein the tensioning means and the cutting device are radially movable relative to the processing apparatus, whereas further the cutting device is pivotable relative to the processing apparatus.
6. Apparatus according to claim 5, **characterised** by cooperating follower rolls and curved tracks provided on the tensioning means and the cutting device as well as the processing apparatus, respectively, for realising the radial motion and pivotment of the tensioning means and cutting device, respectively.
7. Apparatus according to claim 5 or 6, **characterised** by positioning means for positioning a bird to be processed relative to the tensioning means.

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EUROPEAN SEARCH REPORT

Application Number
EP 96 20 2319

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	NL-A-8 101 527 (MEYN) 18 October 1982 * page 2, line 25 - page 4, paragraph 1; claim 1 *	1,6	A22C21/06
A	---		
A	NL-A-7 513 767 (MEYN) 28 February 1977 * the whole document *	1,6	
A	---		
A	EP-A-0 245 543 (LINCO HOLLAND ENGINEERING) 19 November 1987 * page 8, line 28 - page 9, line 22 *	1,6	
A	---		
A	US-A-4 136 421 (SCHEIER) 30 January 1979 * column 5, line 27 - line 68 *	1	
A	---		
A	NL-A-7 510 362 (STORK) 4 March 1977		
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A	US-A-4 467 500 (OLSON) 28 August 1984		TECHNICAL FIELDS SEARCHED (Int.Cl.6)
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A	NL-A-7 315 347 (MEYN) 13 May 1975		
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A	FR-A-2 593 676 (SERVAJEAN) 7 August 1987		
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A	US-A-2 795 815 (DAHLBERG) 18 June 1957		
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A	NL-A-7 801 712 (STORK) 17 August 1979		
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		21 November 1996	De Lameillieure, D
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